Ethanol Plant Requirements – REVISED

Replaces the Information on Page 4

The following provides a **REVISED** range of requirements for grain-based ethanol plants:

Example 1:

20-MILLION LITRE/YEAR ETHANOL PLANT INTEGRATED WITH A CATTLE FEEDLOT

- Between $20 and $25 million for construction and initial startup costs
- Approximately two million bushels of feed wheat per year
- About 60 people to staff the integrated facility – 14 in the ethanol facility and 46 in the feedlot
- Produces the equivalent on 19,600 tonnes of wet distillers' grain annually from the ethanol facility, sufficient to finish up to 70,000 head of cattle (assuming turnover rate of 2.2/year)
- An additional 80,000 tonnes of feed grain and 27,000 tonnes of forage would be required for finishing cattle
- On average, **5.75** cubic feet of natural gas and **0.20** kWh of electricity would be consumed per litre of ethanol produced

Example 2:

80 MILLION LITRE/YEAR ETHANOL PLANT

- Between $50 and $55 million for construction and initial startup costs
- Approximately **8** million bushels of feed wheat per year
- Between 30 and 35 people to staff the ethanol plant
- Produces approximately 78,500 tonnes of dry distillers' grain per year
- On average, 11.5 cubic feet of natural gas and 0.30 kWh of electricity would be consumed per litre of ethanol produced

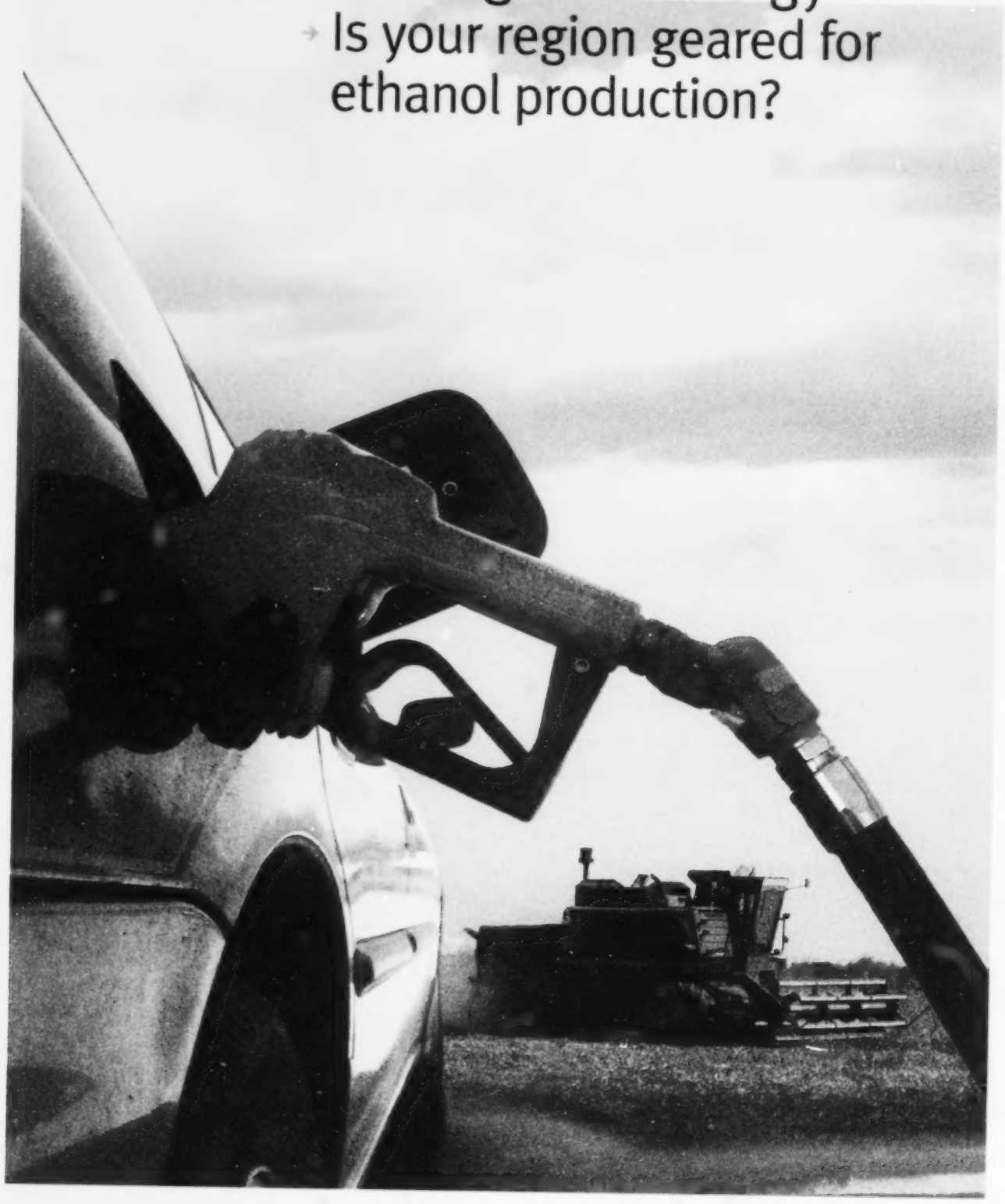
Example 3:

160 MILLION LITRE/YEAR ETHANOL PLANT

- Between $100 and $110 million for construction and initial startup costs
- Approximately **16** million bushels of feed wheat per year
- Between **40** and **50** people to staff the ethanol plant
- Produces approximately 157,000 tonnes of dry distillers' grain per year
- On average, **11.5** cubic feet of natural gas and **0.30** kWh of electricity would be consumed per litre of ethanol produced

Manitoba's Homegrown Energy

Is your region geared for ethanol production?



MANITOBA ENERGY DEVELOPMENT INITIATIVE

Manitoba
Building for the Future

Community Focus

This publication has been developed to help communities determine if an ethanol production facility is a possibility for their area.

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Homegrown Energy in your Region

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Ethanol is a fuel that can be sustainably produced from a wide variety of renewable resources. In Manitoba, this homegrown energy can be produced from wheat or other bioproducts.

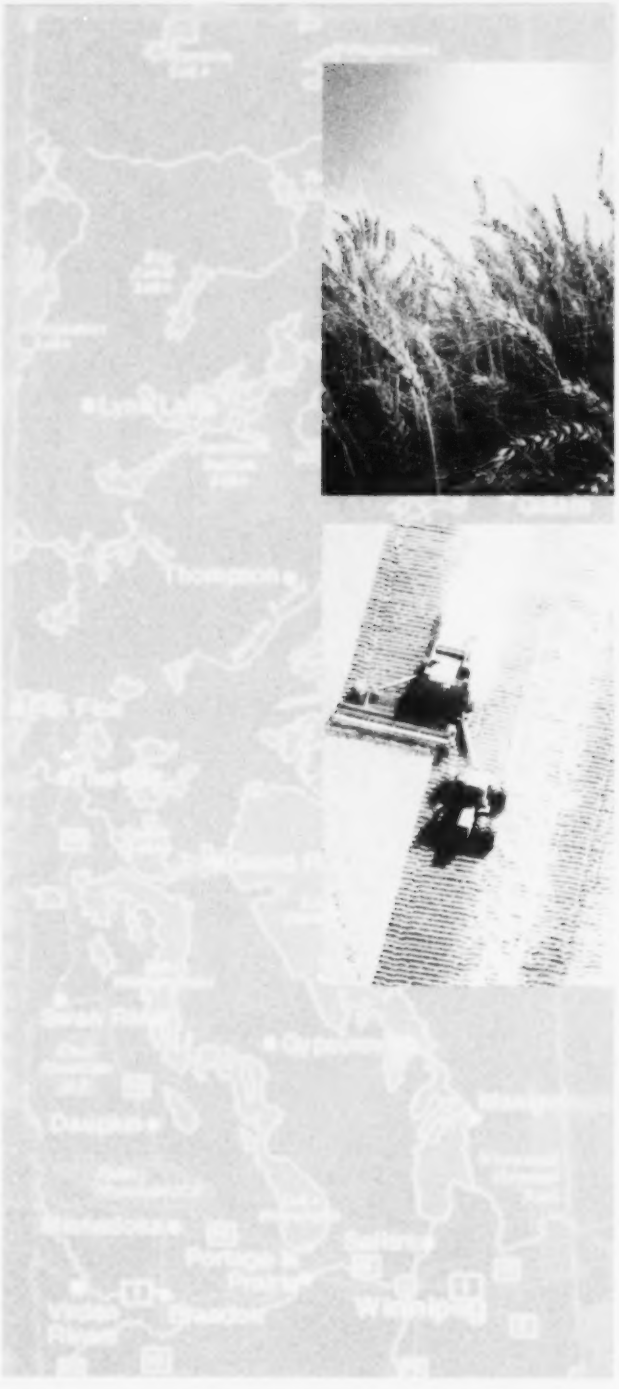
In its 2002 Budget speech, the province committed to expanding ethanol production and its use in Manitoba. Expanding the production and use of ethanol will create jobs and economic stability, particularly in rural communities. It will also contribute to a cleaner environment for the future.

Mixing ethanol with gasoline creates a vehicle fuel called "gasohol". Manitoba is a potential annual market for at least 140 million litres of ethanol, which translates to 1.4 billion litres of gasohol per year. There are also significant export market opportunities for ethanol; as well, the production process creates marketable co-products such as high-quality livestock feed.

For more information on ethanol in Manitoba go to www.manitobaenergy.com

Manitoba is a Good Place to Produce Ethanol

Manitoba is an ideal location for ethanol production. The province has:



- available supplies of wheat and other feedstocks, some of which are more costly to export than to sell locally for ethanol
- excellent transportation connections by road, rail and through the Port of Churchill
- a long history and extensive experience with ethanol, as consumers, retailers, producers and suppliers
- active proponents of ethanol with the technical and financial expertise to succeed on a small, medium or large scale
- a commitment to create an environment that promotes domestic expansion
- a domestic livestock industry that could benefit from alliances with the ethanol and co-product industries
- a history of co-operative development that could prove valuable if the co-operative model is used by potential Manitoba ethanol producers - a model that has demonstrated considerable success in other jurisdictions
- competitive taxes and some of the lowest utility and land costs in Canada
- close proximity to export markets in Eastern Canada and the US

Initial Considerations for your Community

There are many important questions that communities must answer before considering building an ethanol plant in their region. It is a major undertaking for any community regardless of who owns the plant. The community must be ready. The following checklist outlines some initial factors that need to be addressed.

Broad-based Community Support:

- a project champion - an individual capable of leading the project through development to completion
- a strong organizational structure that will allow the community to support the project (i.e., raise financing from the local market, should it be required)
- local governments on side with the proposed project

Site Location Requirements:

- suitable land available to build the plant
- convenient rail and road infrastructure to the plant and to markets
- ready access to sufficient supplies of electricity and natural gas
- sufficient feedstock, in reasonable proximity and available at competitive prices

Plant Requirements:

- sufficient available supplies of water
- sufficient capacity at the local wastewater treatment facility to handle any increased waste
- skilled labour pool available in the surrounding area
- sufficient available mechanical and electrical services in the region

Ethanol Plant Requirements

The following provides a range of requirements for grain-based ethanol plants:

EXAMPLE 1:

20-MILLION LITRE/YEAR ETHANOL PLANT INTEGRATED WITH A CATTLE FEEDLOT

- between $20 and $25 million for construction and initial startup costs
- approximately two million bushels of feed wheat per year
- about 60 people to staff the integrated facility - 14 in the ethanol facility and 46 in the feedlot
- each year about 300,000 bushels of spent distiller's grains from the ethanol facility to be used to finish approximately 70,000 head of cattle
- an additional 80,000 tonnes of feed grain and 27,000 tonnes of forage would be required for finishing cattle
- on average, 11.5 cubic feet of natural gas and 0.30 kWh of electricity would be consumed per litre of ethanol produced

EXAMPLE 2:

80 MILLION LITRE/YEAR ETHANOL PLANT

- between $50 and $55 million for construction and initial startup cost.
- approximately six million bushels of feed wheat per year
- between 30 and 35 people to staff the ethanol plant
- on average, 11.5 cubic feet of natural gas and 0.30 kWh of electricity would be consumed per litre of ethanol produced
- the larger plant could also create ancillary activity in the region through the utilization of its co-products

EXAMPLE 3:

160 MILLION LITRE/YEAR ETHANOL PLANT

- between $100 and $110 million for construction and initial startup costs
- approximately 12 million bushels of feed wheat per year
- between 65 and 70 people to staff the ethanol plant
- on average, 11.5 cubic feet of natural gas and 0.30 kWh of electricity would be consumed per litre of ethanol produced

Community Involvement

Communities interested in ethanol production have to be prepared to get involved. There are a number of ownership models communities can consider that will dictate the degree of involvement.

1) Industry Owned and Operated

The plant is financed by a company from outside the community. The company assumes responsibility for the construction and operation of the facilities, including securing markets for its products. The community's involvement in a project of this type would be to have the required land and infrastructure available for the facility. It would also need to ensure availability of labour and an adequate supply of feedstock.

2) Industry Owned and Operated - With Local Investment

Similar to (1) - however, the community, in addition to having the required infrastructure and assuring availability of feedstock, would also realize, through local investment, opportunities to take an equity position in the project.

3) Community Owned and Operated

This is the more onerous model, but where feasible, can also hold the greatest potential for local benefits. After going through the process of developing a marketable business plan, the community-based organization would be responsible for arranging the necessary equity and debt financing for the project. A management team would then need to be hired to manage the project's construction and ongoing operations. This would include being responsible for securing contracts for the sales of the ethanol and its co-products.

Benefits and Challenges

When an industry-owned company is looking to construct an ethanol plant, it will initiate a site selection process and base its final decision on economic viability. Interested communities must be prepared to provide a detailed information package that outlines their advantages, including: potential plant sites, availability of feedstock, transportation links, water and wastewater infrastructure, utilities (electricity and natural gas), labour and other related support services. The availability of co-product markets (local cattle industry), along with any other benefits the company would realize, is also useful.

A community choosing to own and operate an ethanol plant assures itself of the economic benefits an ethanol plant will bring to the area. However, managing the project will take considerable input from community leaders, first to develop the business plan and then to ensure that the project is adequately financed. Once financing is secured, qualified management will need to be hired to oversee the project. A key component will be to secure markets for the ethanol and co-products.

The Co-operative Option

Developing a new generation co-operative requires the development of a strong organization and a comprehensive business plan.

In light of the current challenges affecting agricultural production - such as changing technology, trade agreements and the elimination of the Crow benefit - many Canadian farmers are choosing to diversify and create new value-added opportunities. These opportunities have led some farmers to develop and operate value-added processing businesses to improve their income, create jobs and improve economic growth locally and throughout the province. Individuals and groups are considering a variety of financing options and organizational structures, including the creation of co-operatives.

The Co-operative Option

Canadians have historically developed co-operatives to accomplish collectively what they cannot accomplish alone. The business structure of traditional and new generation co-operatives can support producers who work together to raise enough capital to jointly own and operate value-added processing businesses.

New Generation Co-operatives

New generation co-ops share many key attributes of traditional co-operatives, including:

- democratic control, based on one-member, one-vote
- distribution of earnings based on use of service or sales to the co-operative
- a board of directors elected by membership

The three attributes that distinguish new generation co-ops from traditional co-ops are:

- a tied-contract, defining delivery rights/obligations
- a membership limited to those who purchase delivery rights
- higher levels of equity investment by individual members

The differences in membership and financial structures are linked to the processing focus of these co-operatives.

Financing A New Generation Co-operative

Individuals buy shares to finance a new generation co-op. Each share represents a contract between the member and the co-operative, providing the member with the right/obligation to deliver one unit of farm product. Total membership is limited by the availability of delivery rights/obligations.

These co-operatives typically raise 30 to 50 per cent of the capital they require by selling shares linked to delivery rights. This level of equity is a significant departure from traditional co-operatives, and usually requires minimal capital contributions by members. The higher equity reduces dependence on debt financing and therefore should enhance the viability of the enterprise. Additional equity may be raised through preferred share offerings, member loans and other securities. Communities are encouraged to research the various co-operative options available.

Case Study:
Al-Corn Clean Fuel - Claremont, MN

Al-Corn's current annual production is 30 million gallons (approximately 115 million litres) of ethanol and 97,750 tons of DDGS, which is derived from 10.5 million bushels of corn. The original plant was constructed in 1995 at a cost of $19 million. Approximately 340 farmers raised 50 per cent of the capital required while the balance was financed by CoBank of Omaha. Expansion to produce 30 million gallons of ethanol was completed in August 2002.

It all started in September 1993, when a group of farmers from southern Minnesota and a local banker toured a nearby ethanol plant in South Dakota. Inspired by their findings, they developed the Al-Corn project.

From June 1994 to March 1995 shares were sold. A project manager was hired, financing was secured and specifications and blueprints for bids were sent out. In April 1995, bids were closed and a general contractor was hired. On April 17, 1995 the groundbreaking ceremony was held. On April 18th, construction began.

Twenty-eight employees were then hired and trained in the process of converting corn into ethanol. The production process began on April 29, 1996.

Help is Available:

Communities may require assistance when assessing the viability of locating an ethanol plant in their regions.

The Province of Manitoba has established a one-stop location for information on ethanol production in your community. We encourage you to contact Jeff Kraynyk at the toll free number below for assistance in developing your community action plan.

Manitoba Ethanol Office
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Ph: 1-800-282-8069, ext: egas(3427)
Fax: 204-943-0031
Email: ethanol@gov.mb.ca
www.manitobaenergy.ca

NOTES:

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